

TRACK 2  
PRELIMINARY SCOPING PACKAGE  
COVER SHEET

prepared in accordance with

TRACK 2 SITES:  
GUIDANCE FOR ASSESSING  
LOW PROBABILITY HAZARD SITES  
AT THE INEL

Site Description: CONTAMINATED SOIL FROM LEAK IN LINE FROM CPP WM-181 TO PEW

Site ID: CPP-16

Operable Unit: 3-07

Waste Area Group: 3

I. SUMMARY - Physical description of the site:

On January 16, 1976, approximately 3000 gallons of low-level contaminated wastewater that contained an estimated 1.2 curies of beta and gamma activity were released inside an open bottom diversion valve box. The inside bottom surface of the valve box was located 5 feet and 8 inches below land surface (bls) after having been filled with one foot of gravel. The valve box is part of the Service Waste Diversion System (SWDS) at the ICPP that has been in operation since 1954. The SWDS is used to divert low-level contaminated wastewater that contains contaminant concentrations beyond levels that could be discharged as plant service waste. The normal practice at the time of the incident was to divert this waste to tank WM-181, where it would subsequently be concentrated in the PEW evaporator after being transferred to the PEW evaporator feed tank, WL-102. The evaporator condensates were normally discharged as service waste, and the concentrated evaporator bottoms were returned to the high-level liquid waste tank farm. The release occurred during a transfer of low-level contaminated wastewater from tank WM-181 to WL-102.

After the release, probing of the contaminated soil at the bottom of the valve box measured elevated radiation levels three feet into the valve box soil bottom, to a depth of approximately 8 feet and eight inches bls. In approximately June 1976, the original valve box was replaced with a concrete bottom valve box and the waste transfer line was relocated. The overall length of both valve boxes was 6 feet and 9 inches. During this project, an excavation to a depth of at least 6 feet and 9 inches would have been necessary to replace the original valve box and thus, some of the contaminated soil could have been removed at that time. However, based on the estimated volume of the release, the overall size of the valve boxes, and the approximate depth of the contaminated soil as indicated by the soil probing results, the excavation alone does not appear to have been sufficiently deep to completely remove the source from this site. In 1977, a synthetic membrane was installed over the entire tank farm that includes the location of this release. The membrane was covered with an additional 2 feet and six inches of top soil.

As a result of the excavations and the installation of the membrane at this site, the source of contamination would have to be located below a depth of approximately 9 feet and 3 inches. The contaminants of potential concern include inorganics and radionuclides.

## TRACK 2 PRELIMINARY SCOPING PACKAGE

### II. SUMMARY - Qualitative Assessment of Risk:

The risk associated from this site has been determined to be low. This determination is based on conservative assumptions that were derived from a review of the available site historical information and were subsequently applied to an evaluation of the risk from the available pathways. Remaining quantities of radionuclides have been conservatively estimated. After a decay of 17 years it is estimated that only .53 curies of activity remain. This discussion is provided in Reference 9 to this document.

### III. SUMMARY - Consequences of Error:

The consequences of error are thought to be minor since good documentation exists that concludes any residual contamination at this site is at least 9 feet bls. Records indicate that the site was backfilled to 9'3". If overexcavation occurred for site access capability, excavation could have occurred to a depth of at least 10 ft. Therefore, no exposure pathways, except ground water, are complete for the current occupational, future residential, for future recreational scenarios. For the ground water pathway, if contamination were left at this site it would be investigated as part of the perched ground water investigation. Additionally, the proximity of this site to the HLLW tanks indicates that the area would probably be excavated during the removal of the HLLW tanks.

### IV. SUMMARY - Miscellaneous Information:

### V. SUMMARY - Conceptual Site Model:

A review of the available site historical information led to the preparation of the Pre-Conceptual Site Model. This model includes all potential generators, release mechanisms, pathways, and exposure routes. After the review of the site information, and subsequent pathway assessment were completed, the Pre-Conceptual Site Model was revised into the Conceptual Site Model. The groundwater pathway is the only complete pathway on the Conceptual Site Model.

**TRACK 2 PRELIMINARY SCOPING PACKAGE**

**Recommendation:**

Based on the evaluation contained herein, a recommendation for no further field investigation is made for this site.

**Signatures**

**# PAGES:**

**DATE:**

Prepared By:

DOE WAG Manager:

Approved By:

Independent Review:

PROCESS/WASTE WORKSHEET SITE DESCRIPTION CPP-16		
Col 1 Processes Associated with this site	Col 2 Waste Description & Handling Procedures	Col 3 Description & Location of any Artifacts/Structures/Disposal Areas Associated with this Waste or Process
Transfer of low-level contaminated wastewater from tank WM-181 to the PEW feed tank, WL-102.	Low-level contaminated wastewater that required treatment at the PEW evaporator before it could be discharged as service waste. At the time of the incident, this wastewater had been diverted to WM-181 where it would be transferred to WL-102.	<p>Artifact: Transfer line and valve</p> <p>Location: Inside the original open bottom valve box as shown on INEL drawing number 105026.</p> <p>Description: The original valve has been replaced, and the transfer line has been relocated.</p>
		<p>Artifact: The new valve box has been designated as C-8</p> <p>Location: This valve box has been installed in the same location as the original valve box.</p> <p>Description: The new valve box is of the same overall length as the original valve box and also has a closed concrete bottom.</p>
		<p>Artifact:</p> <p>Location:</p> <p>Description:</p>

**CONTAMINANT WORKSHEET**  
**SITE DESCRIPTION** CPP-16

**PROCESS (col 1) Transfer of low-level contaminated wastewater**      **WASTE (col 2) low-level contaminated wastewater**

Col 4 What Known/Potential Hazardous Substance/Constituents are Associated with this Waste or Process?	Col 5 Potential Sources Associated with this Hazardous Material	Col 6 FORWARD CALCULATION Known/Estimated Concentration of Hazardous Substances/Constituents <sup>a</sup>	Col 7 BACK CALCULATION Risk-based Concentration	Col 8 Qualitative Risk Assessment (hi/med/lo)	Col 9 Overall Reliability (hi/med/lo)	Col 10 Estimated Loading Rates
Cesium-137	contaminated soil		4.96E+22(1)	Low	NA	NA
Strontium-90	contaminated soil		1.71E+13(1)	Low	NA	NA
Uranium Isotopes	contaminated soil		2.48E+2(2)	Low (3)	NA	NA
Plutonium Isotopes	contaminated soil		9.01E+2(2)	Low (3)	NA	NA

Note: (1) Risk based concentrations based upon the results of GMSCREEN. The unreasonable high soil concentrations are the result of radioactive decay during unsaturated travel time.  
(2) Based on the lowest allowable soil concentration.  
(3) Unsaturated travel time for contaminant is greater than 1500 years according to GMSCREEN.

PROCESS CPP-16

Question 1. What are the waste generation process locations and dates of operation associated with this site?

Block 1 Answer:

The Service Waste Diversion System (SWDS) located at the ICPP has been in operation since approximately 1954. The SWDS remains operational although it has been modified several times since 1954.

Block 2 How reliable are the information sources? X High    Med    Low (check one)  
Explain the reasoning behind this evaluation.

The Operating Occurrence Report (ref. 1) states that the release occurred at the location of a diversion valve that is part of the SWDS during a transfer of low-level contaminated wastewater from tank WM-181 to the PEW feed tank, WL-102.

Block 3 Has this INFORMATION been confirmed? X Yes    No (check one)  
If so, describe the confirmation.

The location of the diversion valve box shown on the sketch of the ECA (ref. 2) coincides with the location of the same valve box shown on INEL drawing numbers 105026, 118445, and 137926 (ref. 3, 4, and 5).

Block 4 Sources of Information [check appropriate box(es) & source number from reference list]

No available information	<input type="checkbox"/>		Analytical data	<input type="checkbox"/>	
Anecdotal	<input type="checkbox"/>		Documentation about data	<input type="checkbox"/>	
Historical process data	<input type="checkbox"/>		Disposal data	<input type="checkbox"/>	
Current process data	<input type="checkbox"/>		Q.A. data	<input type="checkbox"/>	
Aerial photographs	<input type="checkbox"/>		Safety analysis report	<input type="checkbox"/>	
Engineering/site drawings	<input checked="" type="checkbox"/>	<u>2, 3, 4, and 5</u>	D&D report	<input type="checkbox"/>	
Unusual Occurrence Report	<input checked="" type="checkbox"/>	<u>1</u>	Initial assessment	<input type="checkbox"/>	
Summary documents	<input type="checkbox"/>		Well data	<input type="checkbox"/>	
Facility SOPs	<input type="checkbox"/>		Construction data	<input type="checkbox"/>	
OTHER	<input type="checkbox"/>				

PROCESS CPP-16

Question 2. What are the disposal process locations and dates of operation associated with this site?

Block 1 Answer:

The diversion valve that released the low-level contaminated wastewater on January 16, 1976 is part of the SWDS located at the ICPP that has operated since 1954. At the time of the incident, the low-level wastewater did not meet the discharge limitations of the SWDS and thus, it was necessary to divert this waste to tank WM-181 that at the time was being used as the service waste diversion tank. This waste would later be transferred to WL-102 where it would be fed to the PEW evaporator to be concentrated. Generally, the evaporator condensates contained very low levels of radioactive and inorganic contaminants and were discharged as service waste along with other waste streams within the ICPP, mostly condensates from other facilities. The evaporator bottoms were returned to the high-level liquid waste tank farm.

Block 2 How reliable are the information sources? X High    Med    Low (check one)  
Explain the reasoning behind this evaluation.

The Operating Occurrence Report (ref. 1) states that the low-level contaminated wastewater was being transferred to WL-102, and eventually to the PEW evaporator where it would be concentrated.

Block 3 Has this INFORMATION been confirmed? X Yes    No (check one)  
If so, describe the confirmation.

The operation of the SWDS as it applies to the release at this site was confirmed through a conversation with Dave Machovec of WINCO (ref. 6)

Block 4 Sources of Information [check appropriate box(es) & source number from reference list]

No available information	<input type="checkbox"/>		Analytical data	<input type="checkbox"/>	
Anecdotal	<input checked="" type="checkbox"/>	6	Documentation about data	<input type="checkbox"/>	
Historical process data	<input type="checkbox"/>		Disposal data	<input type="checkbox"/>	
Current process data	<input type="checkbox"/>		Q.A. data	<input type="checkbox"/>	
Aerial photographs	<input type="checkbox"/>		Safety analysis report	<input type="checkbox"/>	
Engineering/site drawings	<input type="checkbox"/>		D&D report	<input type="checkbox"/>	
Unusual Occurrence Report	<input checked="" type="checkbox"/>	1	Initial assessment	<input type="checkbox"/>	
Summary documents	<input type="checkbox"/>		Well data	<input type="checkbox"/>	
Facility SOPs	<input type="checkbox"/>		Construction data	<input type="checkbox"/>	
OTHER	<input type="checkbox"/>				

PROCESS CPP-16

Question 3. Is there empirical, circumstantial, or other evidence of migration?  
If so, what is it?

Block 1 Answer:

According to the Occurrence Report, the results of the soil probing effort performed after the incident indicated that a source of contamination was present at this site. The results of the soil probing also indicated that the radioactive contaminants in the wastewater had migrated three feet downward into the soil at the bottom of the valve box.

Block 2 How reliable are the information sources? X High    Med    Low (check one)  
Explain the reasoning behind this evaluation.

The information that a source existed at this site is based on the Occurrence Report. This report also confirmed that at the time of the release, the contaminants in the wastewater had migrated downward into the soil below the valve box.

Block 3 Has this INFORMATION been confirmed? X Yes    No (check one)  
If so, describe the confirmation

A notegram from G.E. Lohse (ref. 7) discusses the soil probing results and their use to estimate the beta and gamma activity of the release.

Block 4 Sources of Information [check appropriate box(es) & source number from reference list]

No available information	<input type="checkbox"/>	Analytical data	<input type="checkbox"/>
Anecdotal	<input type="checkbox"/>	Documentation about data	<input checked="" type="checkbox"/> <u>7</u>
Historical process data	<input type="checkbox"/>	Disposal data	<input type="checkbox"/>
Current process data	<input type="checkbox"/>	Q.A. data	<input type="checkbox"/>
Aerial photographs	<input type="checkbox"/>	Safety analysis report	<input type="checkbox"/>
Engineering/site drawings	<input type="checkbox"/>	D&D report	<input type="checkbox"/>
Unusual Occurrence Report	<input checked="" type="checkbox"/> <u>1</u>	Initial assessment	<input type="checkbox"/>
Summary documents	<input type="checkbox"/>	Well data	<input type="checkbox"/>
Facility SOPs	<input type="checkbox"/>	Construction data	<input type="checkbox"/>
OTHER	<input type="checkbox"/>		

PROCESS CPP-16

Question 4. Does site operating or disposal historical information allow estimation of the pattern of potential contamination? Discuss the estimated patterns of potential contamination over time.

Block 1 Answer:

According to the Occurrence Report, the release of low-level contaminated wastewater inside the open bottom valve box occurred as a single event on January 16, 1976 (ref. 1). After the incident, the liquid waste over time would have the tendency to migrate downward as confirmed by the results of the soil probing and thus, contaminate a region of soil directly below the valve box where the release occurred. Also, it is anticipated that contaminants such as cesium-137 may have the tendency to adhere to the soil and therefore concentrate in the top soil layers such that pockets of soil having concentrated levels of cesium-137 may be encountered.

Block 2 How reliable are the information sources? High ☒ Med ☐ Low (check one)  
Explain the reasoning behind this evaluation.

The results of the soil probing effort documented in the Occurrence Report support this pattern of migration at least to a depth of 3 feet beyond the bottom of the valve box. However, there is no evidence to support the pattern of migration beyond three feet from the bottom of the valve box and thus, the discussion of migration patterns over time are based on speculation.

Block 3 Has this INFORMATION been confirmed? Yes ☒ No ☐ (check one)  
If so, describe the confirmation.

Block 4 Sources of Information [check appropriate box(es) & source number from reference list]

No available information	<input type="checkbox"/>	Analytical data	<input type="checkbox"/>
Anecdotal	<input type="checkbox"/>	Documentation about data	<input type="checkbox"/>
Historical process data	<input type="checkbox"/>	Disposal data	<input type="checkbox"/>
Current process data	<input type="checkbox"/>	Q.A. data	<input type="checkbox"/>
Aerial photographs	<input type="checkbox"/>	Safety analysis report	<input type="checkbox"/>
Engineering/site drawings	<input type="checkbox"/>	D&D report	<input type="checkbox"/>
Unusual Occurrence Report	<input checked="" type="checkbox"/> 1	Initial assessment	<input type="checkbox"/>
Summary documents	<input type="checkbox"/>	Well data	<input type="checkbox"/>
Facility SOPs	<input type="checkbox"/>	Construction data	<input type="checkbox"/>
OTHER	<input type="checkbox"/>		

PROCESS CPP-16

Question 5. Estimate the length, width, and depth of the contaminated region as it is today. What is the known or estimated volume of the source for each potential pathway? If volumes are estimated, explain carefully how the estimates were derived.

Block 1 Answer:

According to a conversation with Dave Machovec of WINCO, approximately 3000 gallons of low-level contaminated wastewater were released at this site (ref. 8). The volume of the contaminated soil is estimated at 1604 ft<sup>3</sup> and based on the following: 1) the dimensions of the valve box at the time of the release (ref. 3), 2) the estimated volume of the release (ref. 8), and 3) a soil porosity of 25%. If the contaminated soil plume is assumed to be cone shape and having a 1:1 slope, the surface area of contamination is 450 ft<sup>2</sup> and the thickness is 8 feet. This estimate is conservative and ignores the effects of soil partition coefficients and retention times.

Block 2 How reliable are the information sources? High Med X Low (check one)  
Explain the reasoning behind this evaluation.

The estimated size of the contaminated region is based on anecdotal information and several conservative assumptions.

Block 3 Has this INFORMATION been confirmed? Yes X No (check one)  
If so, describe the confirmation.

Block 4 Sources of Information [check appropriate box(es) & source number from reference list]

No available information	<input type="checkbox"/>	Analytical data	<input type="checkbox"/>
Anecdotal	<input checked="" type="checkbox"/> <u>8</u>	Documentation about data	<input type="checkbox"/>
Historical process data	<input type="checkbox"/>	Disposal data	<input type="checkbox"/>
Current process data	<input type="checkbox"/>	Q.A. data	<input type="checkbox"/>
Aerial photographs	<input type="checkbox"/>	Safety analysis report	<input type="checkbox"/>
Engineering/site drawings	<input checked="" type="checkbox"/> <u>3</u>	D&D report	<input type="checkbox"/>
Unusual Occurrence Report	<input type="checkbox"/>	Initial assessment	<input type="checkbox"/>
Summary documents	<input type="checkbox"/>	Well data	<input type="checkbox"/>
Facility SOPs	<input type="checkbox"/>	Construction data	<input type="checkbox"/>
OTHER	<input type="checkbox"/>		

PROCESS CPP-16

Question 6. What is the known or estimated quantify of each hazardous substance/constituent at each source? If the quantities are estimates, explain carefully how the estimate was derived.

Block 1 Answer:

The notegram from G.E. Lohse attached as reference 7, states that the release contained an estimated 1.2 Curies of beta and gamma activity. Equally distributing this activity among the predominant gamma and beta emitters would provide a conservative estimate of 0.4 Curies for Cesium-137, Strontium-90, and Yttrium-90. In a matter of weeks after the incident, the quantity of Yttrium-90 would have decayed to levels beyond concern since this radionuclide has a half life of 64 hours. The present remaining activity of Cesium-137, and Strontium-90 even after a decay of 17 years would be 0.27, and 0.26 Curies, respectively.

Block 2 How reliable are the information sources? High ☒ Med ☐ Low (check one)  
Explain the reasoning behind this evaluation.

To derive this estimate, it was necessary to make several conservative assumptions.

Block 3 Has this INFORMATION been confirmed? Yes ☒ No (check one)  
If so, describe the confirmation.

Block 4 Sources of Information [check appropriate box(es) & source number from reference list]

No available information	<input type="checkbox"/>	Analytical data	<input checked="" type="checkbox"/>	<u>7</u>
Anecdotal	<input type="checkbox"/>	Documentation about data	<input type="checkbox"/>	
Historical process data	<input type="checkbox"/>	Disposal data	<input type="checkbox"/>	
Current process data	<input type="checkbox"/>	Q.A. data	<input type="checkbox"/>	
Aerial photographs	<input type="checkbox"/>	Safety analysis report	<input type="checkbox"/>	
Engineering/site drawings	<input type="checkbox"/>	D&D report	<input type="checkbox"/>	
Unusual Occurrence Report	<input type="checkbox"/>	Initial assessment	<input type="checkbox"/>	
Summary documents	<input type="checkbox"/>	Well data	<input type="checkbox"/>	
Facility SOPs	<input type="checkbox"/>	Construction data	<input type="checkbox"/>	
OTHER	<input type="checkbox"/>			

PROCESS CPP-16

Question 7. Is there empirical, circumstantial, or other evidence of a release and/or contamination in a pathway? Discuss the evidence. Address each potential pathway.

Block 1 Answer:

According to the Occurrence Report, the low-level contaminated wastewater migrated to a depth of 3 feet into the gravel layer at the bottom of the valve box. As a result of a previous excavation at this site and the installation of the tank farm protective membrane, the area of contamination would be located at a depth below 9 feet and three inches bls. Under a residential scenario, the contaminants could migrate from the source through the groundwater pathway.

Block 2 How reliable are the information sources? High ☒ Med ☐ Low (check one)  
Explain the reasoning behind this evaluation.

The reliability of the information is considered medium since it is based on speculation.

Block 3 Has this INFORMATION been confirmed? Yes ☒ No ☐ (check one)  
If so, describe the confirmation.

Block 4 Sources of Information [check appropriate box(es) & source number from reference list]

No available information	<input type="checkbox"/>	Anecdotal	<input type="checkbox"/>	Analytical data	<input type="checkbox"/>
Historical process data	<input type="checkbox"/>	Current process data	<input type="checkbox"/>	Documentation about data	<input type="checkbox"/>
Aerial photographs	<input type="checkbox"/>	Engineering/site drawings	<input type="checkbox"/>	Disposal data	<input type="checkbox"/>
Unusual Occurrence Report	<input checked="" type="checkbox"/>	Summary documents	<input type="checkbox"/>	Q.A. data	<input type="checkbox"/>
Facility SOPs	<input type="checkbox"/>	OTHER	<input type="checkbox"/>	Safety analysis report	<input type="checkbox"/>
				D&D report	<input type="checkbox"/>
				Initial assessment	<input type="checkbox"/>
				Well data	<input type="checkbox"/>
				Construction data	<input type="checkbox"/>

PROCESS CPP-16

Question 8. Is there evidence that this hazardous substances/constituents are present at any potential sources today? If so, describe the evidence. For each pathway, discuss flow and transport.

Block 1 Answer:

The Occurrence Report clearly establishes the presence of a source at the time of the incident. This report also indicates that contaminants from the source had migrated into the soil where the release occurred. The available records verify that in 1976 it was necessary to excavate the site to a depth of at least 6 feet and 9 inches to replace the original valve box. Undoubtedly, some of the contaminated soil would have been removed during this excavation. However, it would have been necessary that the depth of this excavation be at least 2 feet deeper to remove the source from this site which according to the soil probing results extends to a depth of 8 feet and eight inches. The available records do not confirm that additional excavation to remove the contaminated soil from this site was performed. Despite that there is no concrete evidence to support the presence of a source at this site today, the available records do imply that a source would have been left behind without the proper excavation depth during the replacement of the original valve box.

Block 2 How reliable are the information sources? High ☒ Med ☐ Low (check one)  
Explain the reasoning behind this evaluation.

The reliability of information to support the presence of a source at this site is primarily based on the Occurrence Report and several drawings included as references 2, 3, 4, and 5.

Block 3 Has this INFORMATION been confirmed? Yes ☒ No ☐ (check one)  
If so, describe the confirmation.

Block 4 Sources of Information [check appropriate box(es) & source number from reference list]

No available information	<input type="checkbox"/>		Analytical data	<input type="checkbox"/>	
Anecdotal	<input type="checkbox"/>		Documentation about data	<input type="checkbox"/>	
Historical process data	<input type="checkbox"/>		Disposal data	<input type="checkbox"/>	
Current process data	<input type="checkbox"/>		Q.A. data	<input type="checkbox"/>	
Aerial photographs	<input type="checkbox"/>		Safety analysis report	<input type="checkbox"/>	
Engineering/site drawings	<input checked="" type="checkbox"/>	2, 3, 4, 5	D&D report	<input type="checkbox"/>	
Unusual Occurrence Report	<input checked="" type="checkbox"/>	1	Initial assessment	<input type="checkbox"/>	
Summary documents	<input type="checkbox"/>		Well data	<input type="checkbox"/>	
Facility SOPs	<input type="checkbox"/>		Construction data	<input type="checkbox"/>	
OTHER	<input type="checkbox"/>				

## REFERENCES

1. Allied Chemical Corporation, Standard Operating Occurrence Report no. 76-3, January 16, 1976.
2. ICPP Engineering Drawing 092095.
3. ICPP Engineering Drawing 105026.
4. ICPP Engineering Drawing 118445.
5. ICPP Engineering Drawing 137926.
6. Telephone Conversation Record between R.R. Rodriguez and Dave Machovec, December 21, 1992.
7. Notegram, G.E. Lohse to O. Cordes, July 6, 1976.
8. Memo of Conversation between Chris Martin and Dave Machovec, December 17, 1991.
9. Site Evaluation Tables 1, 2A, and 3, January 21, 1993

**ECA 16    REFERENCE 1.**

ALLIED CHEMICAL CORPORATION  
OPERATING OCCURRENCE REPORT

**SLAM CAR!**

U. NO 4 1997

File No. 76-3 (Obtain From Q&ES Office) Date of Occurrence 1/16/76

Current Subject: WASTE TRANSFER LINE GASKET LEAK

Occurrence Location (Bldg. Process) Waste Tank Farm To Whom Reported in ERDA ID K. K. Kennedy

ACC Contact: (For Add'l. Details) G. E. Lohse Time & Date Occurrence Reported to ERDA ID 1530, 1/16/76

Preliminary Type Classification:

### Final Type Classification

☐ A ☐ B ☐ C ☒ Other

☐ A ☐ B ☐ C ☒ Other

(Note: Complete Items 1 through 5 for all Reports. If Additional space needed, continue item on plain paper and attach to Report.)

1. DESCRIPTION OF OCCURRENCE (NATURE, EXTENT, LEVELS, AND EFFECTS - INCLUDING SKETCHES OR OTHER REPORTS AS APPROPRIATE)

During a routine transfer of solution from service waste diversion tank WM-181 to the evaporator waste collection tank (WL-102), solution was observed leaking from the flange on one of the diversion valves. The transfer was stopped immediately. Checks on the volume of waste received in WL-102 with that removed from WM-181 indicate that the measurements were well within the detection limits for WM-181. Therefore, the amount of liquid lost cannot be determined.

2. RELEVANT OPERATING CONDITIONS AT TIME OF OCCURRENCE:

Routine transfer of low-level waste back to the evaporator waste collection tank for concentration in the PEW evaporator.

CAUSE OF OCCURRENCE:

☐ Design ☒ Material ☒ Human Error ☐ Procedure ☐ Equipment Failure ☐ Other (Specify) \_\_\_\_\_ ☐ Undetermined at this time

**EXPLANATION OF CAUSE:**

The gaskets were removed from the valve flange. The material was elastomeric. Steam from jetting operations would have heated the flange and caused the gasket to flow. The gasket showed evidence of flow. Also, flange markings on the gasket show that the gasket was improperly installed by construction forces during installation in 1971.

#### 4 CONSEQUENCES OF OCCURRENCE

Operational Delay ☐ Industrial Accident ☐ Local Contamination ☒ Environmental Contamination ☐ Personnel Exposure ☐ Personnel Injuries ☐

Exceeded Safety Limit ☐ None ☒

Other ☐ Specialty:

5. IMMEDIATE CORRECTIVE ACTION TAKEN:

The jetting operation was halted and instructions issued to suspend further transfers through the line until the gasket was changed.

(For Internal SOO Reports)

Original By

Date \_\_\_\_\_

QUES \*

One

Date \_\_\_\_\_

ACM (C2)

✓ For Final SDO Reports Only

Approved By

16M 16F)

**Delet**

0036511

Report No. 76-3 Occurrence Subject WASTE TRANSFER LINE GASKET LEAK

6 SUBSEQUENT CORRECTIVE ACTION TAKEN (IF APPLICABLE)

The gasket was changed out on January 19. Soil samples were taken and probing indicated that activity did not penetrate the soil beneath the valve to a depth greater than three feet. The extent of the soil contamination will be further defined in the spring, after frozen ground has thawed.

003635

7 FINAL CORRECTIVE ACTION PROPOSED: (LIST SPECIFIC ACTION, ACTION ASSIGNEE AND DATE ACTION TO BE COMPLETED)

(Number) Corrective Action to be Taken

Assigned To

Estimated Completion Date

a. The line and valves are to be relocated as part of the ICPP Radioactive Waste Systems Project ( Project No. 76-ID-003).

N. J. Rigstad June 1978

b. Additional probing will be done and an estimate made to obtain the number of curies discharged into soil after the spring thaw.

G. E. Lohse May 1976

8 SIMILAR PREVIOUS OCCURRENCES:

Is this a recurrence of a previous event? ☐ Yes ☒ No

Is this a recurrence of a similar event? ☐ Yes ☒ No

If so, what is the approximate recurrence frequency or interval?

9 ESTIMATED COST OF OCCURRENCE: (SEE PPM 6.03 FOR GUIDELINES - MUST BE INCLUDED ON ALL FINAL REPORTS)

Material/Labor Costs \$ 200

1st Year Exposure (Internal/External) 0.10 Rem

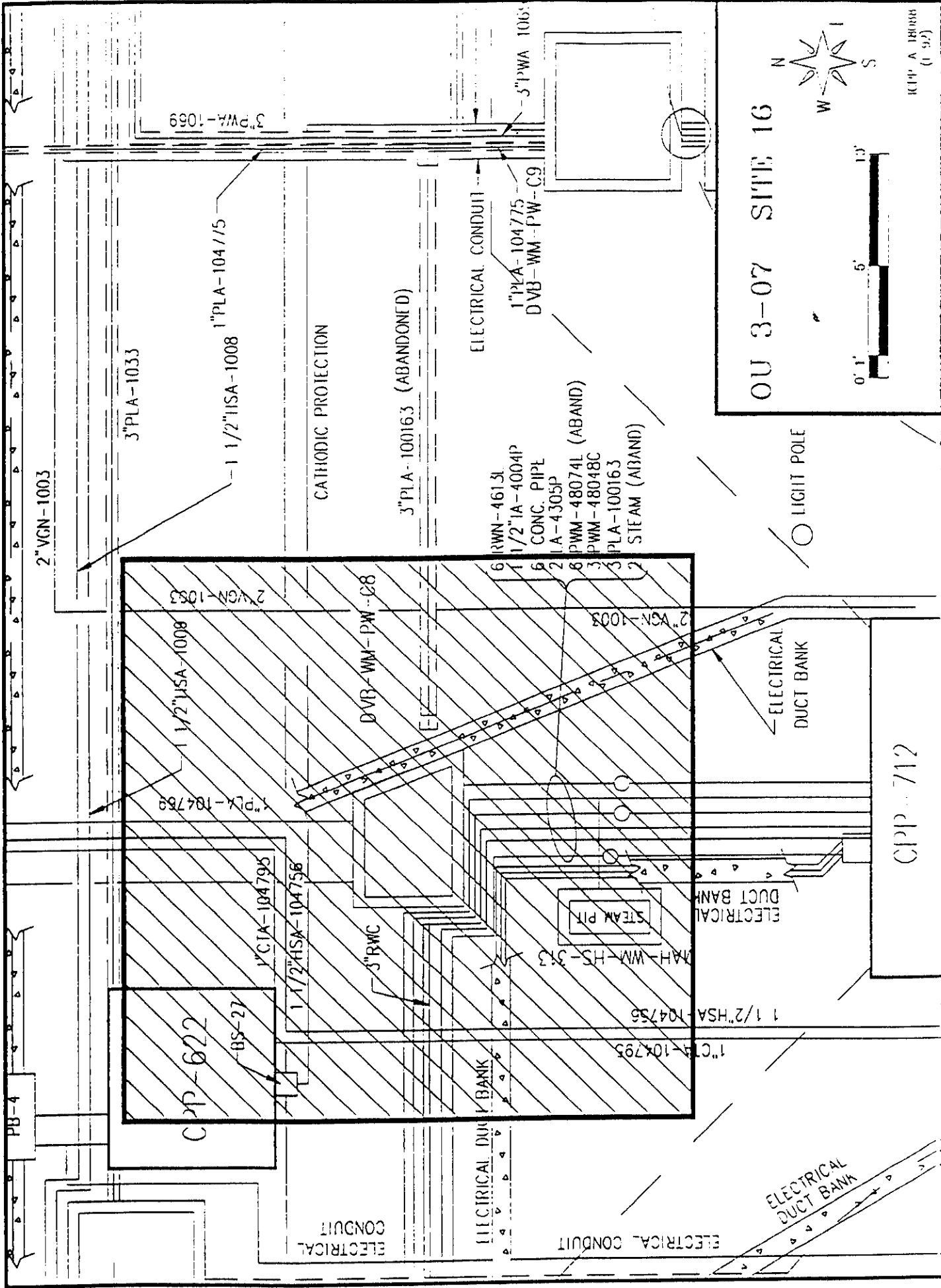
Plant Downtime N/A Days

10 MANAGEMENT COMMENTS:

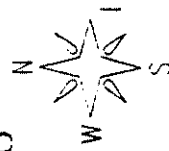
None ☐ Comments:

These are the sorts of incidents which Project 76-ID-003 will alleviate. Project 76-ID-003 will include better quality control than was previously obtained. The expanded surveillance of ICPP Tank Farm greatly assisted in early discovery of the leak.

**ECA 16 REFERENCE 2.**

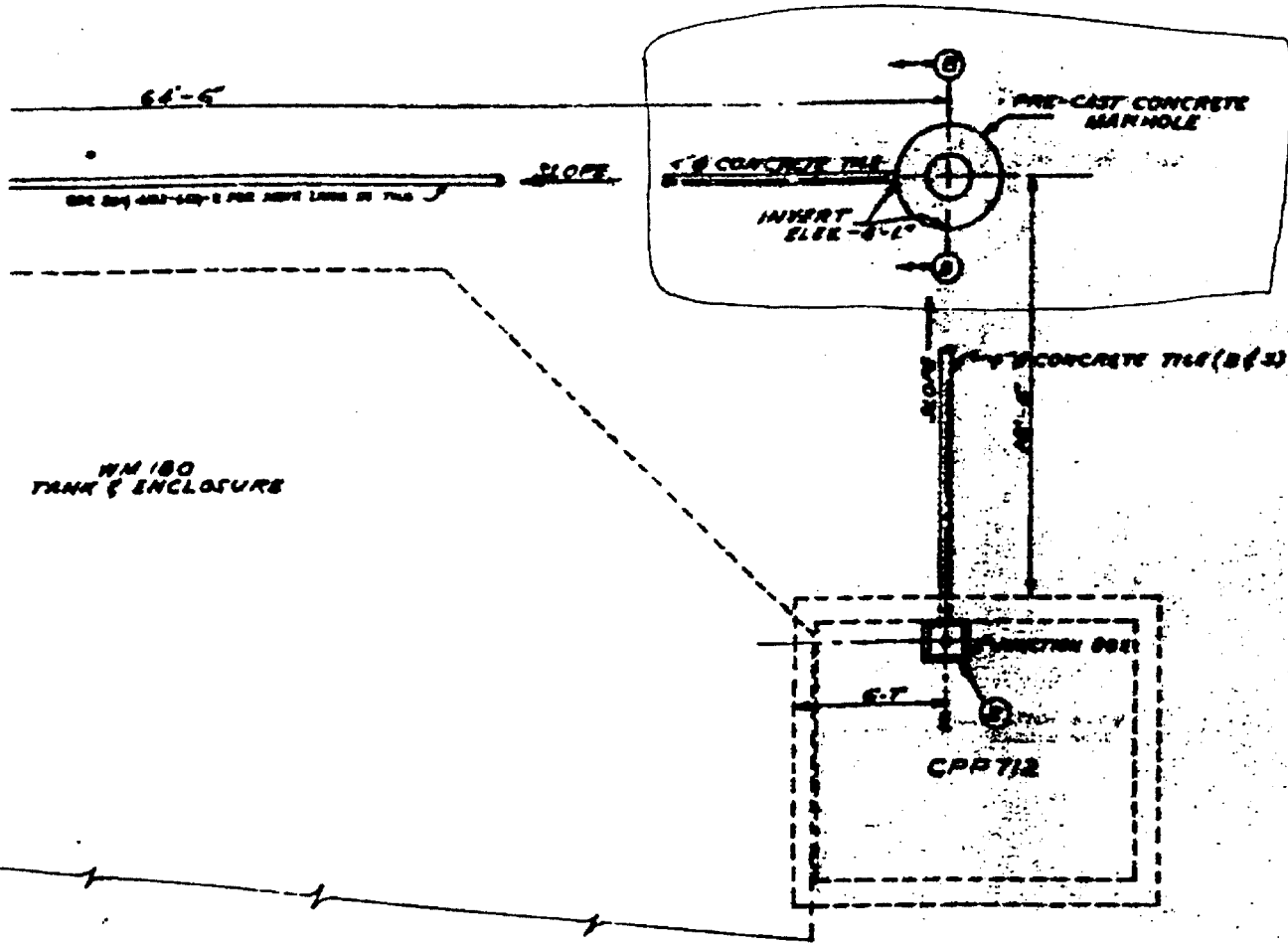


OU 3-07 SITE 16

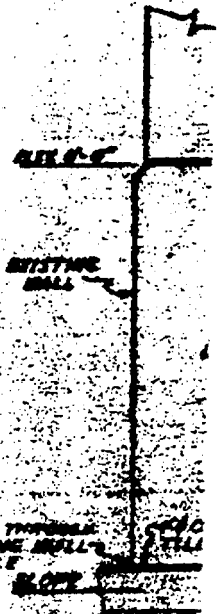
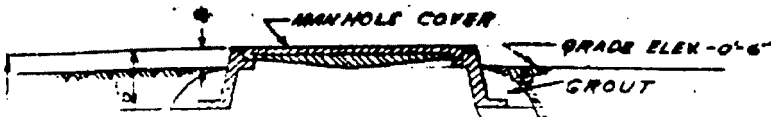
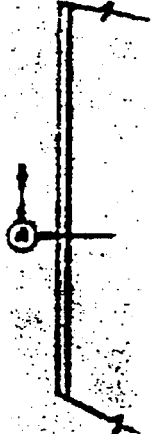


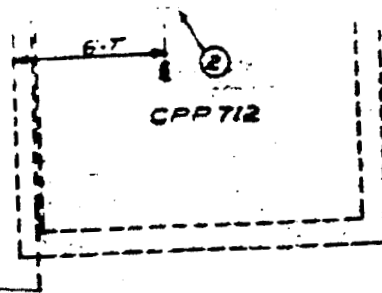
ICP A 18088  
(1 of 2)

**ECA 16 REFERENCE 3.**

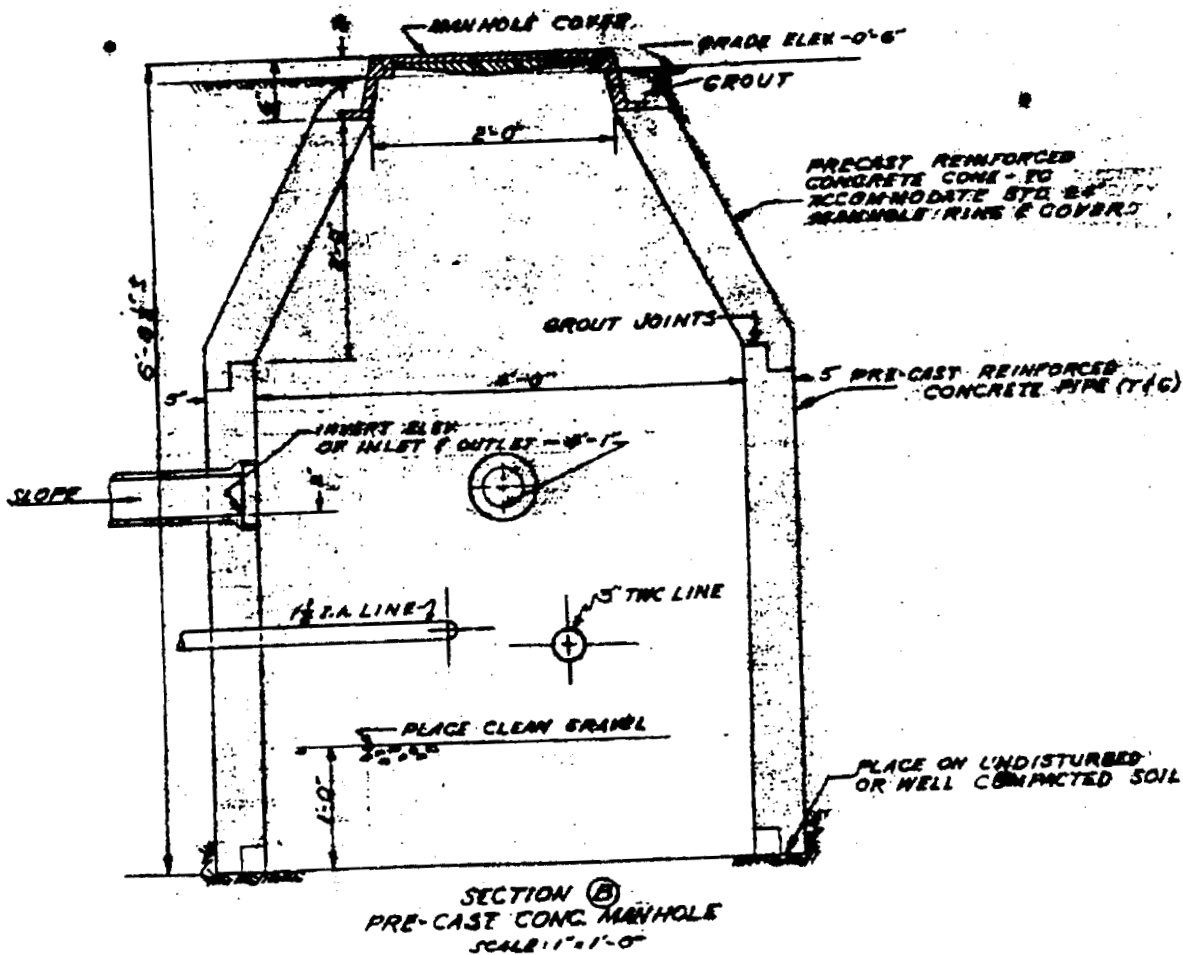


WM 180  
TANK & ENCLOSURE





BREAK THE  
EXISTING  
FOR TILE



**ECA 16 REFERENCE 4.**

A

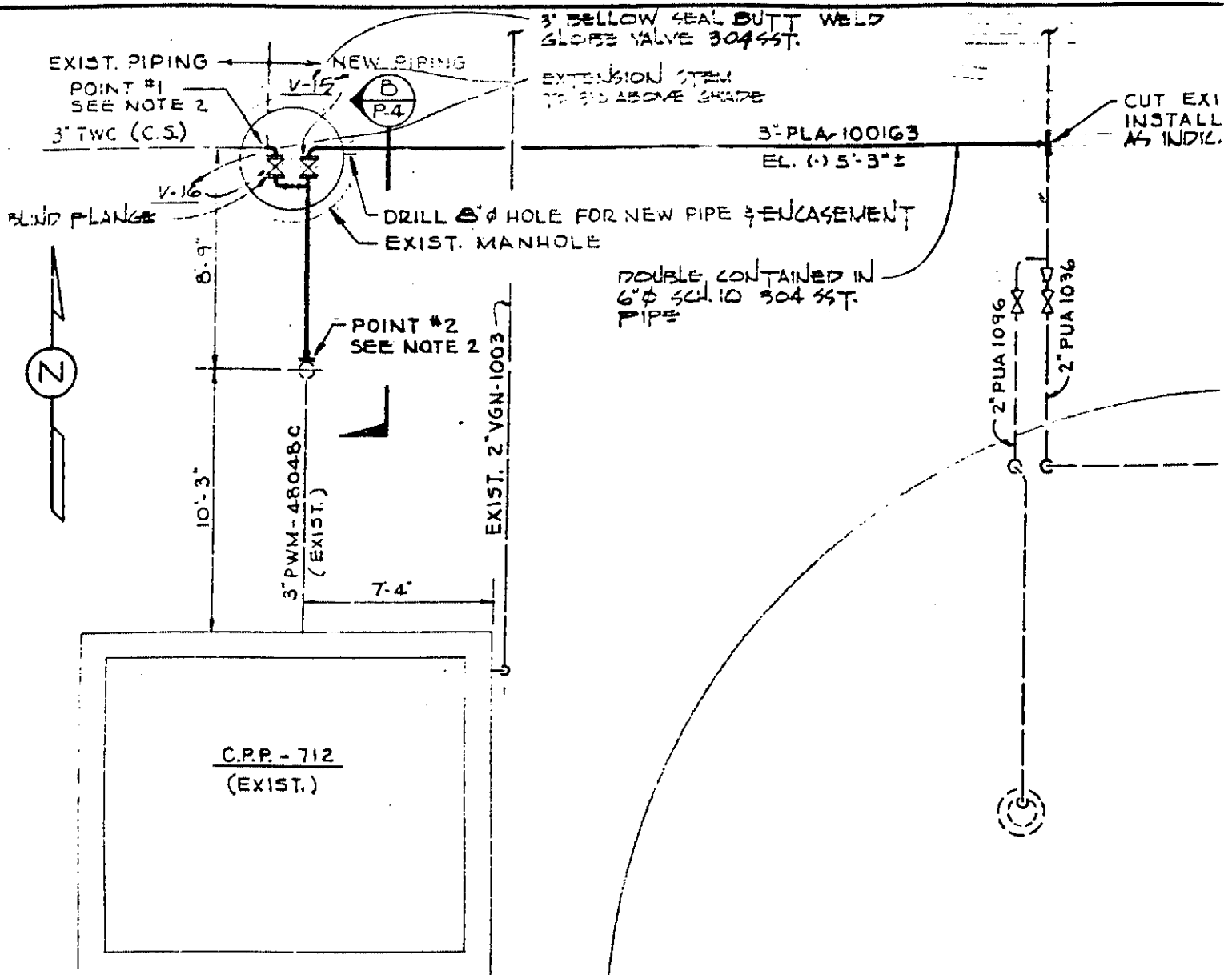
B

C

D

E

F



16'-2 3/4"

DUCTS  
17'-2"

PIPE

1505H

1613L

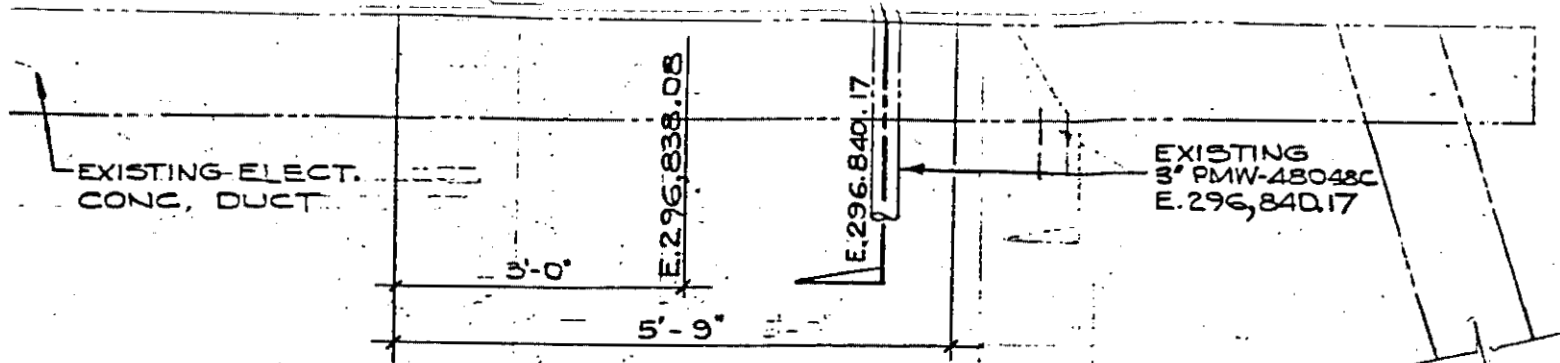
1004P

1305P

-48074L

-48048C

**ECA 16 REFERENCE 5.**



# PLAN - DIVERSION VALVE BOX C-8

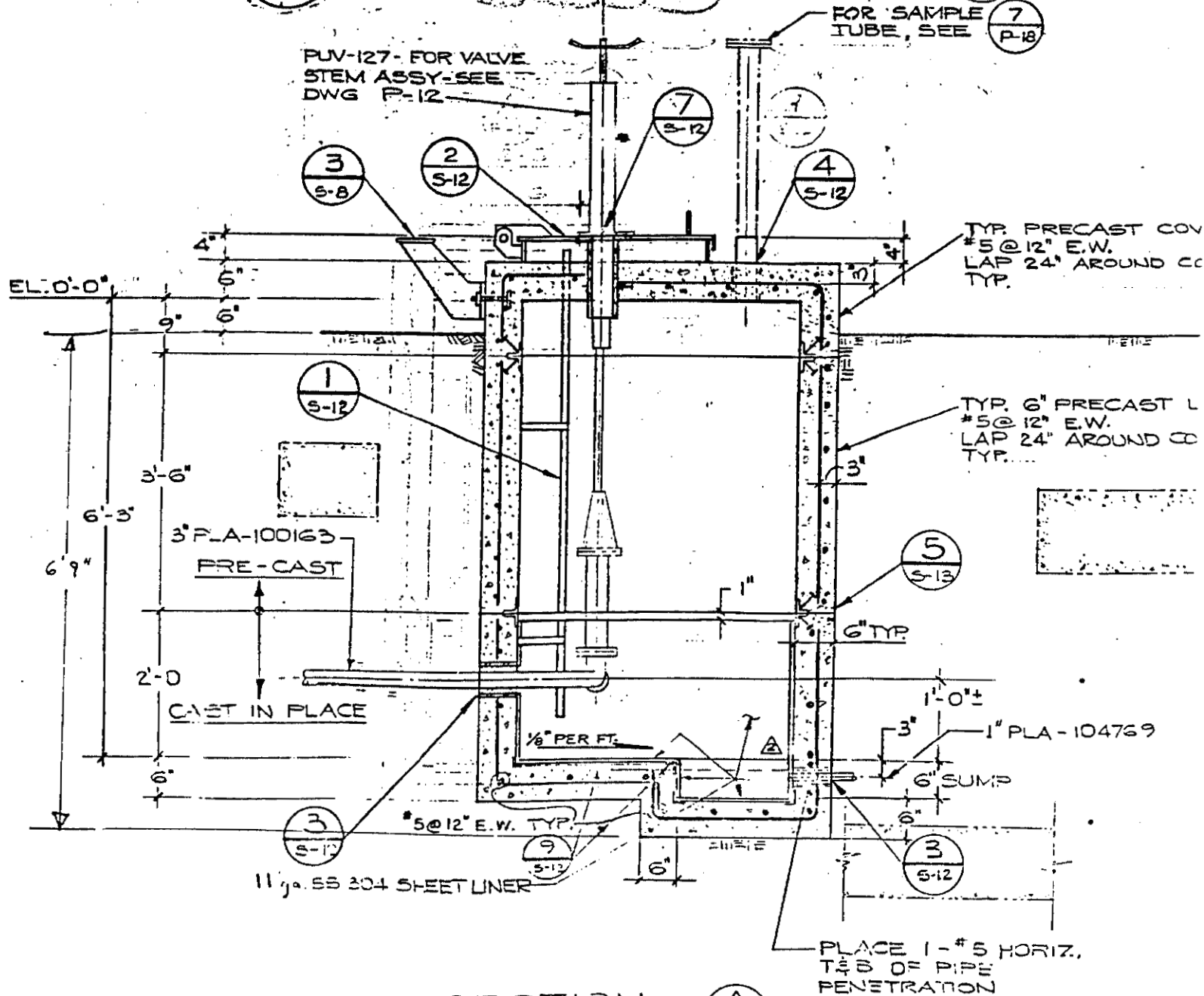
3/4" = 1'-0" (DVB-WM-PW-C8)

1  
S-2

7  
P-18

FOR SAMPLE TUBE, SEE

PLV-127 - FOR VALVE STEM ASSY - SEE DWG P-12



## SECTION

A  
S-2

3/4" = 1'-0"

A B C D E F

**ECA 16    REFERENCE 6.**

# TELEPHONE CONVERSATION RECORD

Project Track 1' for CPP-16

Date Dec. 21 1992

<u>1. Persons Involved</u>	<u>Representing</u>	<u>Phone Number</u>
Dave Machovec	WINCO	526-4033
Rene R. Rodriguez	WASTREN	523-9194

## 2. Subjects Discussed:

Operation of Service Waste Diversion System (SWDS) as it applies to the release at CPP-16

## 3. Questions Raised:

Clarify the operation of the SWDS in regards to CPP-16 and what would be the typical composition of the release?

A. The waste was diverted to WM-181 because too contaminated to be discharged as service waste. This waste is then processed at the PEW evap. and the condensates as usually discharged as service waste after they are sampled in tanks 426-106 & 107. The typical composition of this waste is difficult to define but the most representative composition may be the PEW Evaporator design feed composition

## 4. Decisions/Conclusions/Actions Taken:

## 5. Commitment Dates:

**ECA 16    REFERENCE 7.**

*CHIEF  
THIS IS A SUMMARY  
OF THE  
NOTES*

NOTEGRAM

Date July 6, 1976

To Ormand Cordes Dept. 08ES Address CPP-624

From G. E. Lohse Dept. Operations Address CPP-602

Reference: SOOR 76-1

Final corrective action (Item b) for this SOOR required that additional probing be done to estimate the number of curies discharged into the soil.

Probing has been completed, and the number of curies discharged into the soil was estimated (by Doug Wenzel) to be 1.2 curies of total  $\beta + \gamma$  activity.

cc: C. B. Amberson/r/R. E. Commander

G. E. Lohse

File

PUT IT IN WRITING - WRITTEN MESSAGES SAVE TIME PREVENT AMBIGUOUS INTERPRETATIONS AND ERRORS

003680

**ECA 16    REFERENCE 8**



Westinghouse Idaho  
Nuclear Company, Inc.

## MEMO OF CONVERSATION

Date 12-17-91 Time - Commitment Made ☐ Yes ☒ No Date: \_\_\_\_\_

Person Calling CHRIS MARTIN Person Called DAVE MICKSHOUSE

Representing ER Representing THUR FILL

Purpose of Conversation Information clarification CPP-16

Text of Conversation \_\_\_\_\_

Q What was the instrument detection limit  
in WM-181 in 1976

A. Returned call later, WM-181 was full range  
at that time. Therefore, limit was  $\pm 30''$  or  
3000 gal.

Signed

Chris Martin

Date 12-24-91

## **ECA 16    REFERENCE 9**

**Table 1. Pathway assessment.**

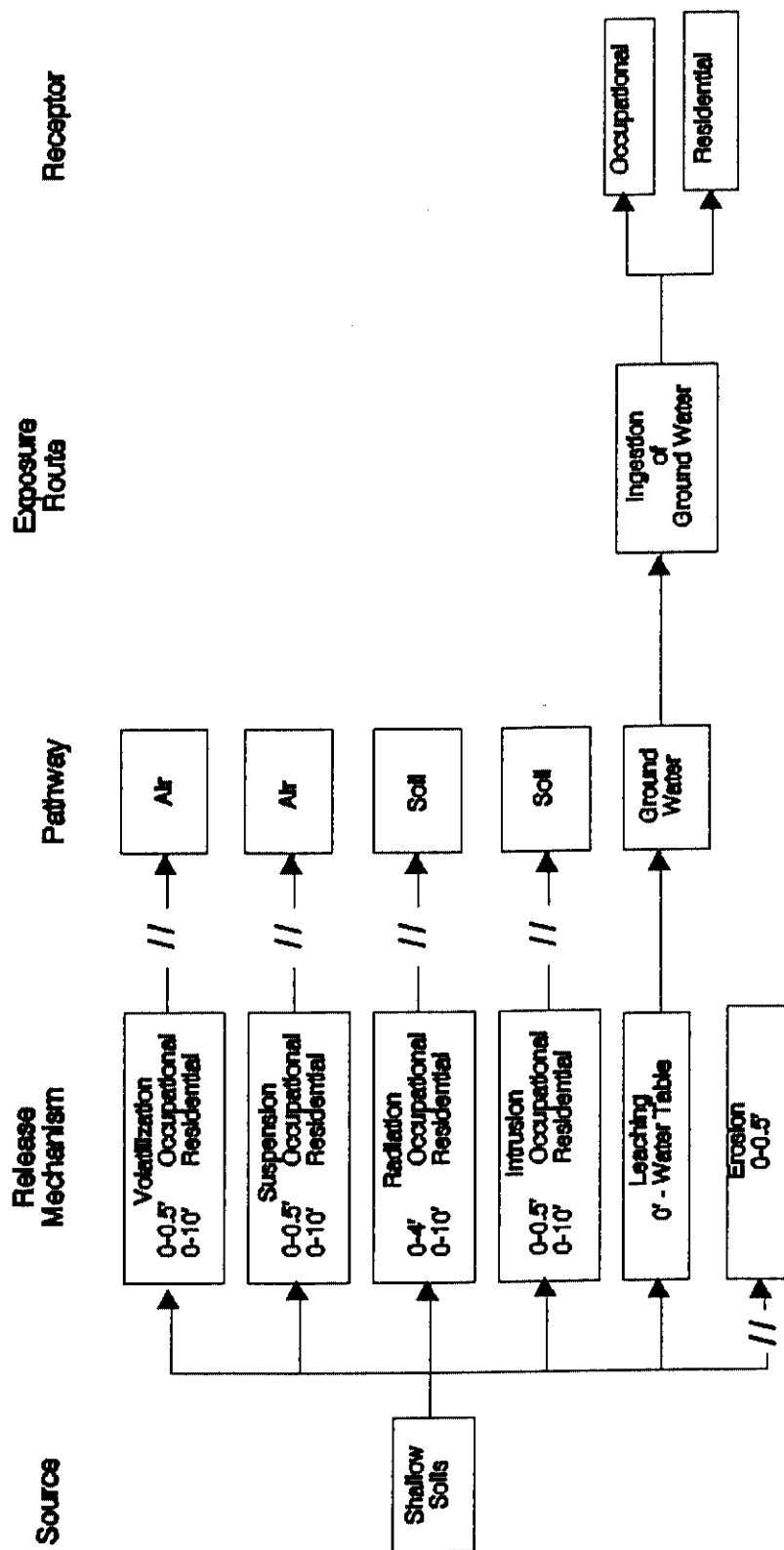
OU: 3-07 Site: CPP-16 Pathway/receptor: All pathways/Current occupational, future residential

Historical information	Current source by pathway	Release mechanism	1. Pathway completeness 2. Justification
Based upon the replacement of valve box C-8, the top of any residual contamination would be at a minimum depth of 9 feet 3 inches below land surface (bls). This depth of contamination is well documented in ICPP engineering drawings related to the replacement of valve box C-8. Given this depth to contamination, this pathway is not complete and the pathway specific historical information will not be included.	Air: Volatilization Area: 450 ft <sup>2</sup> Volume: 1604 ft <sup>3</sup> (1)	Volatilization → Inhalation	1. Pathway completeness 2. Justification  Air: Volatilization → Inhalation 1. Pathway is incomplete. 2. There is no source between 0-6 inches and 0-10 feet for occupational and residential scenarios, respectively (Note: top of contamination is 9 feet 3 inches bls).
Based upon the replacement of valve box C-8, the top of any residual contamination would be at a minimum depth of 9 feet 3 inches below land surface (bls). This depth of contamination is well documented in ICPP engineering drawings related to the replacement of valve box C-8. Given this depth to contamination, this pathway is not complete and the pathway specific historical information will not be included.	Air: Fugitive Dust Area: 450 ft <sup>2</sup> Volume: 1604 ft <sup>3</sup> (1)	Fugitive Dust → Inhalation	Air: Fugitive Dust → Inhalation 1. Pathway is incomplete 2. There is no source between 0-6 inches and 0-10 feet for occupational and residential scenarios, respectively (Note: top of contamination is 9 feet 3 inches bls).
Based upon the replacement of valve box C-8, the top of any residual contamination would be at a minimum depth of 9 feet 3 inches below land surface (bls). This depth of contamination is well documented in ICPP engineering drawings related to the replacement of valve box C-8. Given this depth to contamination, this pathway is not complete and the pathway specific historical information will not be included.	Soil: Intrusion Area: 450 ft <sup>2</sup> Volume: 1604 ft <sup>3</sup> (1)	Intrusion → Ingestion	Soil: Intrusion → Ingestion 1. Pathway is incomplete 2. There is no source between 0-6 inches and 0-10 feet for occupational and residential scenarios, respectively (Note: top of contamination is 9 feet 3 inches bls).
Based upon the replacement of valve box C-8, the top of any residual contamination would be at a minimum depth of 9 feet 3 inches below land surface (bls). This depth of contamination is well documented in ICPP engineering drawings related to the replacement of valve box C-8. Given this depth to contamination, this pathway is not complete and the pathway specific historical information will not be included.	Soil: Radiation Area: 450 ft <sup>2</sup> Volume: 1604 ft <sup>3</sup> (1)	Radiation → Ext. Exp.	Soil: Radiation → External Exposure 1. Pathway is incomplete 2. There is no source between 0-6 inches and 0-10 feet for occupational and residential scenarios, respectively (Note: top of contamination is 9 feet 3 inches bls).
The release of low-level contaminated wastewater occurred inside a valve box at a depth of 5 feet and 8 inches bls. The results of the soil probing effort performed after the release indicated that the area of contamination extended 3 feet into the soil at the bottom of the valve box to a depth of 8 feet and 8 inches. The excavation to replace the valve box went to a depth of at least 6 feet and 9 inches. During the installation of the protective membrane over the tank farm, an additional 2 feet and 6 inches of soil was placed over the site and thus, the current source of contamination is located below a depth of 9 feet and 3 inches.	Soil: Leaching to groundwater Area: 450 ft <sup>2</sup> (1) Volume: 1604 ft <sup>3</sup> (1) Thickness = 8 ft. Diameter of the original valve box (4 feet) will be used as the distance parallel to gw flow.	Leaching to groundwater → Groundwater ingestion	Soil: Leaching to groundwater → Groundwater ingestion 1. Pathway is complete
Based upon the replacement of valve box C-8, the top of any residual contamination would be at a minimum depth of 9 feet 3 inches below land surface (bls). This depth of contamination is well documented in ICPP engineering drawings related to the replacement of valve box C-8. Given this depth to contamination, this pathway is not complete and the pathway specific historical information will not be included.	Surface Water: Erosion Area: 450 ft <sup>2</sup> Volume: 1604 ft <sup>3</sup>	Erosion → Soil ingestion	Surface Water: Erosion → Soil ingestion 1. Pathway is incomplete 2. There is no source between 0-6 inches and 0-10 feet for occupational and residential scenarios, respectively (Note: top of contamination is 9 feet 3 inches bls).
Sources of information:	Notes:		
See references 1-8 of the Track 2 Preliminary Scoping Document	(1) Volume calculation is based on a one time release of 3000 gallons saturating a soil column having a porosity of 25%. The area of contamination is based on an initial release area of 12.5 ft <sup>2</sup> (inside diameter of valve box) and migrating downward at a 1:1 slope.		
Summary of Pathway Assessment	The area of contamination is located at a depth below 9 feet and 3 inches and thus, the groundwater pathway is complete and will be the only pathway evaluated further.		

OU: 3-07	Site: CPP-16	Pathway/receptor: Soil: Groundwater ingestion/current occupational, future residential	Release Mechanism: Leaching to groundwater						
Preliminary list of contaminants <sup>a</sup>	Screening approach for contaminants of concern <sup>b</sup>	Source term <sup>c</sup>	Risk (fwd. calc.)	Risk-based concentration (bkwd. calc.)				Additional interpretation & justification Overall uncertainty	Data adequate to assess risk?
				Occupational		Residential			
				SC at HQ=1	SC at 1E-06 Risk	SC at HQ=1	SC at 1E-06 Risk		
Cesium-137 Strontium-90	152065 years at Kd = 500 968 years at Kd = 3	Cone-shaped Area: Depth to contam. = 9 feet Area = 450 ft <sup>2</sup> Thickness = 8 ft Volume = 1604 ft <sup>3</sup> A = 12.5 ft <sup>2</sup>	-- --	NA NA	NA NA	NA NA	NA <sup>a</sup> NA <sup>a</sup>	Decays > 5000x in unsaturated zone Decays 33x in unsaturated zone	Yes Yes
Uranium-234 <sup>f</sup> Uranium-235 <sup>f</sup> Uranium-236 <sup>f</sup> Uranium-238 <sup>f</sup>	1881 years at Kd = 6 1881 years at Kd = 6 1881 years at Kd = 6 1881 years at Kd = 6	Length parallel to groundwater is 4 ft.	-- -- -- --	NA NA NA NA	NA NA NA NA	NA NA NA NA	3.56E+03 3.54E+03 3.77E+03 2.48E+02	Unsaturated travel time > 1500 years Unsaturated travel time > 1500 years Unsaturated travel time > 1500 years Unsaturated travel time > 1500 years	Yes Yes Yes Yes
Plutonium-238 <sup>f</sup> Plutonium-239 <sup>f</sup> Plutonium-240 <sup>f</sup> Plutonium-241 <sup>f</sup>	6749 years at Kd = 22 6753 years at Kd = 22 6753 years at Kd = 22 6743 years at Kd = 22		-- -- -- --	NA NA NA NA	NA NA NA NA	NA NA NA NA	1.32E+26 9.01E+02 1.50E+03 1.40E+146	Unsaturated travel time > > 1500 years Unsaturated travel time > > 1500 years Unsaturated travel time > > 1500 years Unsaturated travel time > > 1500 years	Yes Yes Yes Yes

Assumptions:	<p>See Track 2 Scoping Document and Pathway completeness/Justification column of Table 1.</p>
Notes:	<p>SC = Soil Concentration (pCi/g)          NA = Not Applicable</p> <ol style="list-style-type: none"> <li>Yttrium-90 is a short lived radionuclide and was not evaluated further as a predominant beta emitter.</li> <li>Time required for the contaminant to migrate from the source to the groundwater using the specified kd.</li> <li>See question 5 of the Track 2 Preliminary Scoping Document.</li> <li>A risk evaluation under an occupational scenario is not required due to existing institutional controls and depth of contamination.</li> <li>Risk based concentrations unreasonably high due to radioactive decay during unsaturated travel time.</li> <li>Contaminants possibly present in waste stream, but not identified in existing documentation.</li> </ol>
Summary of Table 2A Risk Evaluation	

OU 3-07 Track 2  
 CPP-16 Conceptual Site Model



// denotes break in pathway

# CPP-16 Track 1 Prime Pre-Conceptual Model

